

LOAN TARGETING AND FINANCIAL INTERMEDIATION  
COSTS IN HONDURAS

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1. Introduction

Specialized credit institutions have received particular attention from governments and international funding agencies in the last decade. Donors see these institutions as a financial innovation capable of increasing the flow of internal and external finance to selected sectors and client groups within the economy. Concern about rural poverty, food self-sufficiency and low agricultural productivity, together with the belief that governments should promote agricultural modernization have led to the creation of these specialized institutions, characterized by a loan portfolio highly concentrated in agriculture and a limited scope for the provision of other banking services (Von Pischke, Heffernan and Adams).

Large amounts of targeted funds have been channelled through these agricultural development banks from governments and donor agencies. These funds are invariably lent out at concessionary interest rates, a practice that contributes to the fragmentation of credit markets in low income countries. Until recently, little attention had been given to the costs of financial intermediation associated with these special credit projects or lines of credit. It has been assumed that these costs are negligible, with little

effect on the behavior of the intermediaries or their clients. Recent research, however, has highlighted the importance of transaction costs associated with different stages of the intermediation process in many low income countries.<sup>1/</sup>

Financial intermediation costs can be identified at three levels: (1) expenses incurred by depositors in searching for a depository institution and making deposits; (2) resources used by the intermediary in servicing deposits and other funds, and in handling loan transactions; and (3) costs incurred by borrowers in negotiating, obtaining and repaying loans. In this study we concentrate on the costs borne by the intermediary and the relationship between these operational costs and loan targeting or end-use requirements. In particular we will document and analyze the effects of targeted funds on the intermediation costs of BANADESA, the National Agricultural Development Bank of Honduras (hereafter referred to as the ADB) and a major private commercial bank (referred to as the PCB) in the same country. We show that loan targeting requirements imposed on lenders have significant cost-increasing effects on their operations.

It is useful to distinguish between two effects of loan targeting on lender's costs. The first effect is comprised

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<sup>1/</sup> Several essays on these subjects appear in Adams, Graham and Von Pischke. See also Nyanin, and Saito and Villanueva.

of the direct costs of additional accounting and record-keeping personnel and materials necessary to comply with the reporting requirements of special credit programs. These direct costs would also include all additional personnel (agronomists, livestock specialists, etc.) specifically hired and trained to service the project's clientele or target-groups. Increased costs due to loan monitoring and supervision are also classified under this first category. Second, there is an indirect (or less visible) effect derived from the impact of interest-rate ceilings and special loan rates that accompany targeted funds. These constraints on the usual practice of loan-rate differentiation force lenders to establish complicated loan procedures in order to discriminate between potential borrowers with different degrees of risk. These regulatory-induced loan procedures generate further costs for both lenders and borrowers, in addition to the direct costs of loan targeting. In what follows, however, we shall focus on the direct or visible effects of targeted funds on the intermediation costs of the banks in question.

We first present a brief background and methodological discussion of the procedures used in the study. The next section documents the performance of targeted funds over time in the agricultural development bank (ADB) and analyzes their effects on portfolio composition and costs. We then

present the results of a comparative analysis of intermediation costs between the ADB and the comparable private commercial bank (PCB) in Honduras. This comparison underscores the impact of special credit projects from international donors on the lending costs of both institutions. In the final section we draw out the major conclusions of our analysis.

## 2. Background and Methodology

The Honduran financial system has been working under different regulatory schemes during the last decade. These have included interest-rate ceilings, manipulation of reserve requirements, and loan targeting, among other forms of intervention. Recent years have been characterized by increasing rates of inflation and a decreasing trend in the overall level of liquidity in the system, due mainly to the growing share of the public sector in total domestic credit (Graham and others). There are 16 commercial banks, 2 government-owned development banks and several savings and loan institutions in Honduras. The two banks involved in our study account for over one-quarter of the value of all new loans made by Honduran banks, and nearly half of the value of new formal loans made for agricultural purposes. Agricultural loans account for about three-quarters of the value of the ADB's loan portfolio, and for about one-seventh of the value of the PCB's loans.

Two different though complementary approaches are utilized in this study to document and analyze the effects of loan targeting on the costs of financial intermediation. First, we consider the behavior of the different sources of funds that finance the loan portfolio of the ADB in the period 1971-1982, and discuss their effects on portfolio composition and the ADB's administrative costs. The methodological approach adopted for this analysis is described in section 2.1. Secondly, we investigate the contrasting features of the ADB's costs as compared to the PCB's costs, focusing on their relationships with the different degree of reliance upon external funds observed in the two banks. The methodology utilized in this comparative study is outlined in section 2.2.

## 2.1 Sources of Funds and Costs for the Agricultural Development Bank (ADB)

Our analysis of the performance of targeted funds and their effects on the ADB's intermediation costs relies upon data for 28 branches of this bank over the 12-year period 1971-1982. We discuss the behavior of the changing shares of different sources of funds in the loan portfolio and the change in portfolio composition using descriptive tables and correlation analysis. We then specify a cost function for the ADB, that is used as the basis for the assessment of the effects of targeted funds on the bank's intermediation costs.

The bank's cost function is derived assuming that the financial intermediary minimizes costs,  $C$ , subject to the constraint of a function that relates the production of banking services,  $Q$ , to the use of productive factors and inputs,  $X_i (i=1, \dots, n)$ . The model can be summarized as follows:

$$\text{minimize } C = \sum_{i=1}^n p_i X_i \quad , \text{ cost equation,} \quad (1)$$

subject to

$$Q = f(X_1, \dots, X_n) \quad , \text{ production function,} \quad (2)$$

where  $p_i (i=1, \dots, n)$  represents factor prices.

The solution of the system formed by equations (1), (2) and the first-order conditions for cost minimization yields a cost function that depends on the "output" level  $Q$  and factor prices,  $p_i$ .

$$C = \Phi (Q, p_1, \dots, p_n) . \quad (3)$$

This same approach underlies other empirical studies on banking costs and economies of scale in banking (Benston, Hanweck and Humphrey, Gheen).

We introduce the effect of loan targeting in equation (3) by assuming that the total demand for every factor of production  $X_i$ , can be decomposed into two parts: (a)  $X_{i1}$ , which corresponds to the level of  $X_i$  consistent with an unregulated environment; and (b),  $X_{i2}$ , an additional quantity of resources or a differential skill that is required under the targeting scheme. This corresponds to what we

defined as direct or visible effects of targeted funds in Section 1. We hypothesize that the effect of targeted funds on costs in the case of a development bank can be described as including a "ratchet" effect. This means that the increased level of costs growing out of a new credit project contracted by the bank does not decline to the previously existing cost level once the loan funds have been disbursed to the ultimate borrowers. Additional resources are hired or purchased at the beginning of the project in order to comply with the project's targeting requirements, but these resources are not laid off or sold once the funds are exhausted. The cost function will thus incorporate a set of variables,  $S$ , that capture the effect of targeted funds under the "ratchet" effect hypothesis:

$$C = \Phi(Q, p_1, \dots, p_n, S) \quad (4)$$

Only resource costs are included in the dependent variable of this cost function. They were measured as total administrative costs, net of depreciation and provisions for bad debt, obtained from the annual income-expenditure statements of the branches. Cost function (4) was specified as a generalized power function (DeJanvry) and estimated through OLS using different definitions of output and alternative specifications for the effect of the targeting indicators ( $S$ ). The results of the regression analysis are presented and discussed in Section 3.



## 2.2 Comparative Study of Development Bank and Private Bank Costs: Methodology

Our comparative analysis of the level and structure of lending costs of the agricultural development bank and the private commercial bank also focused on the non-financial (administrative) costs of both banks. Risk-related costs such as provision for bad debt were excluded from the analysis given the different criteria applied by the accounting units of the two institutions. A representative sample of branches was selected in both cases, accounting for 55% of the loan portfolio and for 49% of total non-financial costs in the case of the ADB. These percentages were 86% and 88% respectively in the PCB case.

The 1981 income-expenditure statements of the branches were the basis for our cost estimates. The identification of the expenses related directly to credit operations and the functional breakdown of these costs were based on branch-level surveys undertaken separately in both institutions during 1982. These surveys consisted of a set of questionnaires administered by the authors in interviews with branch managers, credit officials, agronomists, credit analysts, accounting personnel and clerical employees. The results of this comparative cost analysis of the effects of targeting are presented and analyzed in Section 4.

### 3. Loan Targeting and Intermediation Costs in the Agricultural Development Bank

Throughout our analysis we identify targeted funds as those obtained by the bank from the central bank or from foreign donor agencies. Central bank funds correspond typically to crop-specific lines of credit designed to provide short-term financing to small and medium-size farmers. Foreign funds usually come in the form of special projects targeted to specific activities, and tend to include a larger proportion of long-term loans. The term "external funds" will be used to refer to both central bank and foreign funds combined. The other, non-targeted, source of funds for the ADB refers to demand, savings and time deposits largely from public-sector institutions, and to a lesser extent from the public at large.

#### Sources of Funds and Portfolio Composition

The shares of different sources of funds in the ADB's portfolio of new loans for the period 1971-1982 are presented in table 1. The proportion of the total value of new loans (or loan amount) funded through deposit mobilization has decreased from an average of 56% in the period 1971-1974 to an average of 43% in the last four years. Consequently, external funds (central bank and foreign funds combined) have increased their share in loan amounts from a 44%-average in the first four years to a 57%-average for the period 1979-1982. Foreign funds were predominant among

Table 1. Shares of Different Sources of Funds in the Agricultural Development Bank (ADB)  
Portfolio of New Loans, and Average Loan Size by Source, 1971-1982.

Year	Source of Funds									Central Bank and Foreign Funds Combined	
	Deposits			Central Bank			Foreign Funds				
	Share in No. of Loans %	Share in Loan Amount %	Average Loan Size Lps. <sup>1/</sup>	Share in Loans %	Share in Loan Amount %	Average Loan Size Lps.	Share in Loans %	Share in Loan Amount %	Average Loan Size Lps.	Share in Loans %	Share in Loan Amount %
1971	64.5	64.7	1223	0	0	---	35.5	35.3	1217	35.5	35.3
1972	32.0	53.4	2215	0	0	---	68.0	46.6	910	68.0	46.6
1973	24.9	54.6	3318	3.7	0.5	208	71.4	44.9	953	75.1	45.4
1974	19.6	51.5	3348	41.0	8.9	276	39.4	39.6	1282	80.4	48.5
1975	19.6	39.8	2236	43.2	20.0	507	37.2	40.2	1188	80.4	60.2
1976	30.4	56.1	2679	9.0	12.1	1942	60.6	31.8	760	69.6	43.9
1977	31.9	64.5	4528	22.5	14.7	1464	45.7	20.8	1021	68.2	35.5
1978	10.4	33.0	8976	76.1	35.2	1306	13.5	31.8	6608	89.6	67.0
1979	7.7	46.2	17953	80.4	33.8	1256	11.9	20.0	5027	92.3	53.8
1980	5.9	34.7	15107	79.2	40.5	1312	14.9	24.8	4293	94.1	65.3
1981	4.3	42.1	22496	77.2	36.5	1036	18.5	21.4	2641	95.7	57.9
1982	5.0	49.8	27238	63.5	30.2	995	31.5	20.0	1729	95.0	50.2

Source: BANADESA, Economic Studies Department.

<sup>1/</sup> 1 US\$ = 2 lempiras

external sources during the first half of the period under analysis, while gradually decreasing in importance within this group after 1975. Central bank funds became the most important component among external funds in the second half of the period.

The share of deposits in the number of loans decreased drastically from an average of over 40% in the first four years of the period to a remarkably small 5%-average in the last four years, reflecting the re-allocation of these funds to increasingly larger-sized loans. The relationship between the average size of loans granted out of deposits and the average size of loans funded by external sources grew from about 3:1 in the early 70's to over 7:1 in the early 80's (see table 1).

The increased share of external sources of funds both in the number of loans and in the value of loans would suggest that agriculture as a whole, and especially small farmers, have increased their share in the ADB's portfolio of new loans. The loan-size figures presented in table 1 and the shares of agricultural loans in the ADB's portfolio shown in table 2 allow an examination of the degree to which loan targeting has been effective in modifying the composition of the ADB's loan portfolio.

Data on loans by farm size are not available for the period under discussion here, therefore we use the average loan sizes reported in table 1 as a reasonable proxy. It is

Table 2. Shares of Agriculture Loans in The ADB  
Portfolio of New Loans, 1971-1982.

Year	Crops		Livestock		Total Agriculture (Crops + Livestock)	
	Share in	Share in	Share in	Share in	Share in	Share in
	No. of Loans %	Loan Amount %	No. of Loans %	Loan Amount %	No. of Loans %	Loan Amount %
1971	74.3	40.1	23.6	27.5	97.9	67.6
1972	70.7	43.2	25.7	30.2	96.4	73.4
1973	67.7	46.5	27.4	29.6	95.1	76.1
1974	83.9	62.6	13.9	19.8	97.8	82.4
1975	88.8	74.2	8.8	13.6	97.6	87.8
1976	86.1	61.3	12.4	13.8	98.5	75.1
1977	79.8	79.2	14.4	12.6	94.2	91.8
1978	89.1	85.2	9.3	7.1	98.4	92.3
1979	91.4	76.0	7.0	6.7	98.4	82.7
1980	96.7	72.4	1.5	3.9	98.2	76.3
1981	94.7	57.3	3.8	8.4	98.5	65.7
1982	93.1	68.2	5.4	8.5	98.5	76.7

Source: BANADESA, Economic Studies Department.

clear from these figures that the average loan size serviced by external funds has not changed substantially over the period 1971-1982. This, in turn, suggests that the share of small loans in the portfolio of new loans has not experienced significant variations in this period. On the other hand, the share of loans to agriculture (crops + livestock) in the ADB's portfolio (table 2) by the early 80's was at the same level of the early 70's, about 70% of the total value of new loans. The highest shares are observed in 1977-1978, when agricultural loans accounted for over 90% of the portfolio. Within agriculture, crop loans have in general increased their share of new loans, while the share of livestock loans ~~to~~ has decreased steadily since 1972.

In short, the increasing share of external funds, through the period under analysis, has not been associated with an increased share of agricultural loans in the portfolio. The peak years of 1977-1978 may be better explained by real-sector phenomena such as the "coffee boom" rather than by an increased proportion of the bank's loan funds being supplied by external sources under targeting arrangements. These findings are reinforced by the results of the correlation analysis between the shares of sources of funds in the portfolio and the share of agricultural loans.

None of the sources of funds showed a statistically significant correlation with total agricultural loans. The

correlation coefficients between external funds (combined or separate) and agricultural loans were not statistically different from zero, either taking the shares in the number of loans or the shares in the value of new loans. Significant coefficients were found only when correlating the shares of different sources of funds with the shares of the components of total agricultural loans, i.e., crops and livestock. Table 3 summarizes these results, showing the specialization of external funds in terms of the activities financed, central bank funds primarily financing crop enterprises and foreign funds focusing on livestock activities.

Table 4 presents the correlation coefficients between the shares of the different sources of funds in the portfolio of new loans. There is a high negative correlation between central bank funds and foreign funds, showing that these external sources have been substituting for each other during the period under analysis. Central bank funds have been also compensating for the decline in importance of deposits as a source of funds, as denoted by the negative correlation between these two sources.

These findings may be summarized as follows: (a) the growing share of external sources of funds (largely directed towards agriculture) has not been reflected in a significant change in the relative role of agricultural loans in the portfolio. The fungibility of finance is at work here, with

Table 3. Correlation Coefficients Between Sources of Funds and New Loans to Agriculture in the ADB.<sup>1/</sup>

Loans to Agriculture	Source of Funds					
	Deposits		Central Bank		Foreign Funds	
	Number	Amount	Number	Amount	Number	Amount
<u>Crops<sup>2/</sup></u>						
Number	-0.36		0.38		-0.32	
Amount		-0.25		0.33		-0.28
<u>Livestock<sup>3/</sup></u>						
Number	0.44		-0.48		0.41	
Amount		0.31		-0.42		0.36

<sup>1/</sup> All coefficients significant at .01 level.

<sup>2/</sup> N = 283

<sup>3/</sup> N = 292



Table 4. Correlation Coefficients Between Shares of Sources of Funds in the ADB Loan Portfolio.<sup>1/</sup>

Source of Funds	Source of Funds					
	Deposits		Central Bank		Foreign Funds	
	Number	Amount	Number	Amount	Number	Amount
<u>Deposits</u>						
Number	1.		-0.85		0.56	
Amount		1.		-0.79		0.13 <sup>2/</sup>
<u>Central Bank</u>						
Number			1.		-0.91	
Amount				1.		-0.69
<u>Foreign Funds</u>						
Number					1.	
Amount						1.

<sup>1/</sup> N = 299, all coefficients significant at .01 level, unless specified otherwise.

<sup>2/</sup> Significant at .05 level.

external funds substituting for own-deposit funds that have been transferred from agricultural to non-agricultural loans. (b) As a consequence targeting goals, in terms of the increased participation of the agricultural sector in the loan portfolio, have not been achieved; (c) the increased share of external funds may have induced the re-allocation of non-targeted funds to increasingly larger-sized loans in the non-agricultural sector. This cost-saving adjustment compensates for the increasing costs of handling a growing proportion of external funds in the "targeted" portion of the loan portfolio.

#### The ADB Cost Function and the Effects of Loan Targeting

The cost function derived in its general form in section 2.1 is specified as a power function that includes output, the price of labor services and the loan targeting indicators. Different definitions of output and different assumptions concerning the probable effect of targeting on costs have led us to create several specifications of the cost function. Output is defined alternatively as two separate services (loans,  $L$ , and deposits,  $D$ ), or as the combination of the two jointly-produced services (loans plus deposits,  $Q$ ). The total value of new loans granted each year, and the value of end-of-year deposit balances are utilized as the corresponding measures of the two services produced by the bank.

To deal with the effect of loan targeting, three dummy variables ( $S_i, i=1,2,3$ ) are defined to account for the effect of the three different sources of funds; deposits, central bank, and foreign funds. In order to capture the effect of targeted funds under our "ratchet" effect hypothesis (see section 2.1),  $S_i$ 's are defined so that  $S_i > 0$  if the value of funds coming from source  $i$  has increased with respect to the level observed in the previous year, otherwise  $S_i = 0$ . A combined dummy variable,  $S_{23}$  is similarly defined to account for the effect of all external funds combined (central bank and foreign funds together). Our "ratchet effect" hypothesis implies that a positive sign is expected in the coefficients of the  $S_i$  variables that capture the effects of targeted funds, i.e., central bank and foreign funds. We consider the possibility that these effects may be lagged, particularly in the case of foreign donor funds, since this source of funding is often granted in the form of special projects with delayed period of disbursement and expenditures.

These dummy variables representing the sources of funds enter the cost function in two alternative ways: (1) as a log-linear effect on the total cost function; and (2) as an interactive effect with the marginal cost of loans, or the marginal cost of total output, depending on the definition of output. External funds combined, and foreign funds alone were also specified with a one-year lag, to capture the

lagged effect increases in these sources of funds are likely to have on costs.

As a result of the several forms of specifying output and loan-targeting effects, we derived the following mathematical forms for the cost function (4):

Effect of Loan-Targeting (Source of funds)	Output Specification	
	Loans and Deposits as separate Outputs	Loans plus Deposits as a Combined Output
Log-Linear	$C = \alpha L^\beta D^\gamma W^\delta e^{\sum_i \lambda_i S_i}$	$C = \alpha Q^\lambda W^\delta e^{\sum_i \lambda_i S_i}$
Interactive	$C = \alpha L^{(\beta_0 + \sum_i \beta_i S_i)} D^\gamma W^\delta$	$C = \alpha Q^{(\lambda_0 + \sum_i \lambda_i S_i)} W^\delta$

where: C, is total administrative costs net of depreciation and provisions for bad debt

L, is total value of new loans

D, is total deposits balances

W, is average monthly salary

Q, is the sum of loans plus deposits

$S_i$ , are the dummy variables representing the sources of funds

In each case, different combinations of  $S_i$ 's are estimated:

- (a) deposits, and external funds combined (central bank and foreign funds)
- (b) deposits, and lagged external funds
- (c) deposits, central bank, and lagged foreign funds

Results of the regression analysis performed on the linearized versions of these functional forms are reported

in tables 5 through 7. Table 5 shows the estimated coefficients and relevant statistics for the functional form that includes loans and deposits as separate variables, and specifies a log-linear effect of the sources of funds. Table 6 reports our results in the case of two separate outputs (loans and deposits), and interactive effects assumed for the sources of funds. Table 7 summarizes the results obtained with the definition of output as a combined product of loans plus deposits. The results of both log-linear and interactive specifications for the effects of sources of funds are reported in this table. In all equations the economic variables are measured in nominal terms. Results obtained with the variables expressed in real terms (not reported here) do not show any meaningful difference from those reported here.

A general evaluation of the results presented in tables 5 through 7 indicates that these specifications can be considered satisfactory from the statistical point of view. The equations with loans and deposits specified as separate variables show R-square values of 0.80 or 0.81 (tables 5 and 6). These values appear somewhat lower (0.76, 0.77) in the case of the equations that include the combination of loans plus deposits as the output variable (table 7). The coefficients for output variables and average salary are positive and statistically significant at the .01 level in all

Table 5. Effects of Sources of Funds on ADB  
Intermediation Costs: Regression  
Results for Log-linear Effect.

$$\text{Functional Form: } C = \alpha L^{\beta} D^{\delta} W^{\epsilon} \sum_i a_i S_i$$

Explanatory Variables	Equation Number		
	1	2	3
Loans (L) (new loans in Lp. '000)	0.4627* (0.0256)	0.4540* (0.0251)	0.4456* (0.0254)
Deposits (D) (balances in Lp. '000)	0.1321* (0.0309)	0.1338* (0.0306)	0.1324* (0.0305)
Wage Rate (W) (average salary, Lp.)	0.6091* (0.1034)	0.6416* (0.0977)	0.6888* (0.0996)
<u>Source of Funds (S<sub>i</sub>)</u> (dummy variables)			
Deposits	-0.0712+ (0.0338)	-0.0789* (0.0311)	-0.0936* (0.0327)
Central Bank & Foreign Funds	-0.0257 <sup>o</sup> (0.0517)		
Lagged (Central Bank & Foreign)		0.1156* (0.0427)	
Central Bank			0.0511 <sup>o</sup> (0.0423)
Lagged Foreign Funds			0.1317* (0.0429)
Intercept	4.8219* (0.4823)	4.5894* (0.4396)	4.3658* (0.4525)
R <sup>2</sup>	0.80	0.81	0.81
F-Value	229.51	236.68	199.33

OLS estimation with all variables in natural logs, excepting dummy variables. Standard errors in parenthesis, N = 288 in all equations.

Significance levels: \* .01.

+ .05.

o not significant at .20 level.

Table 6. Effects of Sources of Funds on ADB Intermediation Costs: Regression Results for Interactive Effect.

$$\text{Functional Form: } C = \alpha L^{\beta_0 + \sum_i \beta_i S_i} D^{\gamma} W^{\delta}$$

Explanatory Variables	Equation Number		
	1	2	3
Loans (L) (new loans in Lp. '000)	0.4732* (0.0271)	0.4534* (0.0251)	0.4427* (0.0261)
Deposits (D) (balances in Lp. '000)	0.1327* (0.0309)	0.1347* (0.0305)	0.1334* (0.0304)
Wage Rate (W) (average salary, Lp.)	0.6065* (0.1019)	0.6339* (0.0965)	0.6784* (0.0981)
<u>Source of Funds (S<sub>i</sub>)</u> (dummy variables)			
Deposits	-0.0086 <sup>+</sup> (0.0045)	-0.0100* (0.0040)	-0.0115* (0.0042)
Central Bank & Foreign Funds	-0.0021 <sup>o</sup> (0.0069)		
Lagged (Central Bank & Foreign)		0.0169* (0.0056)	
Central Bank			0.0075 <sup>x</sup> (0.0056)
Lagged Foreign Funds			0.0179* (0.0056)
Intercept	4.7408* (0.4686)	4.6194* (0.4435)	4.4271* (0.4489)
R <sup>2</sup>	0.80	0.81	0.81
F-Value	228.95	237.98	200.00

OLS estimation with all variables in natural logs, excepting dummy variables. Standard errors in parenthesis, N = 288 in all equations.

Significance levels: \* .01  
+ .05  
x not significant at .15 level.  
o not significant at .5 level.

Table 7. Effects of Sources of Funds on ADB Intermediation Costs: Regression Results with Total Output Defined as Loans plus Deposits. Log-Linear Effect and Interactive Effect.

	Equation Number			
	1	2	3	4
Explanatory Variables	Log-linear effect $C = \alpha Q^{\lambda} W^{\delta} e^{\sum_i a_i S_i}$		Interactive effect $C = \alpha Q^{\lambda_0 + \sum_i \lambda_i S_i} W^{\delta}$	
Total Output (Q) (Lp. '000)	0.5919* (0.0341)	0.5849* (0.0333)	0.5905* (0.0355)	0.5848* (0.0330)
Wage Rate (W) (average salary, Lp.)	0.7335* (0.1093)	0.7547* (0.1033)	0.7366* (0.1079)	0.7267* (0.1023)
<u>Source of Funds (<math>S_i</math>)</u> (dummy variables)				
Deposits	-0.8076+ (0.0371)	-0.0964* (0.0340)	-0.0049 <sup>x</sup> (0.0049)	-0.0099+ (0.0044)
Central Bank & Foreign Funds	-0.0016 <sup>o</sup> (0.0566)		0.0088 <sup>x</sup> (0.0074)	
Lagged (Central Bank & Foreign)		0.1304* (0.0466)		0.0209* (0.0061)
Intercept	3.7057* (0.5106)	3.5569* (0.4657)	3.6052* (0.4962)	3.6783* (0.4734)
R <sup>2</sup>	0.76	0.77	0.76	0.77
F-Value	226.99	235.22	225.53	236.22

OLS estimation with all variables in natural logs, excepting dummy variables.

Standard errors in parenthesis, N = 288 in all equations.

Significance levels: \* .01.

+ .05.

x not significant at .2 level.

o not significant at .5 level.



estimated equations. Furthermore, the values of the coefficients associated with these variables are fairly stable across different specifications.

The findings summarizing the effects of different sources of funds on costs are also significant and consistent across equations, as outlined below:

- (i) In all equations the estimated coefficients for the dummy variables capturing the effects of external funds (central bank and/or foreign) are always algebraically larger than the coefficients associated with own-deposits.
- (ii) Own-deposits show a negative and significant effect on costs in all equations, with only one instance in which the negative sign is not statistically significant (table 7, column 3).
- (iii) The effect of targeted funds combined (central bank plus foreign funds) are either positive or not significantly different from zero. Non-significant coefficients are obtained when the current-year value of the dummy variable that captures the effect of these external funds is included in the equation (column 1 in tables 5 and 6, and columns 1 and 3 in table 7). However, when the lagged effect of external funds (central bank plus foreign) is specified in the cost equations, the estimated coefficients in all such equations show a positive sign and are statistically

significant at the 1% level. These results can be seen in column 2 of tables 5 and 6, and columns 2 and 4 of table 7.

- (iv) When central bank and foreign donors are considered as separate sources of targeted funds (column 3 in tables 5 and 6), the lagged effect of foreign funds is positive and significant, whereas the coefficient of the dummy variable for the central bank funds is not significantly different from zero. This result suggests that the order of magnitude of the cost effects of the three different sources of funds decreases from foreign funds to central bank funds to own-deposits. The first two sources of funds are cost-increasing, while the latter (own-deposits) is a cost-saving source of funds.
- (v) These results are qualitatively identical for the two alternative ways in which the source-of-funds variables enter the cost equation. The comparison of the estimated coefficients for these variables between the log-linear form (table 5) and the interactive form (table 6) only show differences in the magnitudes of the estimates. In the log-linear specification the different sources of funds affect the overall administrative costs of the bank, without a direct effect on the marginal cost of lending. In the second set of equations, however, the sources of funds show a direct

effect on the marginal cost of lending as well. These costs decrease, ceterisparibus, when own-deposits increase in the liability portfolio of the bank. In contrast, the marginal cost of lending will increase when the additional liquidity comes from external sources.

In summary, our results indicate that there is a lagged, "ratchet"-type effect of targeted funds on the intermediation costs of the agricultural development bank of Honduras. Overall administration costs and the marginal costs of lending are increased as a result of additional funding received from external sources. This effect is more striking and significant in the case of foreign funds than in the case of rediscount lines of credit coming from the central bank. On the other hand, greater reliance on own-deposits as a source of loan funds will have cost-saving effects on both overall intermediation costs and the marginal cost of lending.

#### 4. Comparative Cost Analysis: The Agricultural Development Bank and a Private Commercial Bank

##### Administrative Costs of Banks

As shown in table 8, the average agricultural loan made by the private commercial bank (PCB) used in our analysis was almost seven times as large as the ADB's loans. In part, this helps explain the sharp difference in average costs per unit of money lent by the two banks. Ignoring

loan defaults, loan transaction costs of the PCB were only 2.5 percent of the value of its loans, compared to ADB costs of 8.4 percent (line 2).<sup>2/</sup> Part of the dissimilarity in costs was also related to differences in the sources of funds for lending. In 1981 three-fifths of the money lent by the ADB came from rediscount lines with the Central Bank or from external aid donors, while only 7 percent of the PCB's liabilities were from these sources. Deposits made up 91 percent of all the PCB's loanable funds, but only 40 percent for the ADB. Accordingly, lending costs made up a much larger proportion of overall costs in the ADB than in the PCB, 77 percent versus 33 percent (line 3). These differences in the source of funds caused dissimilarities in the makeup of their costs, as will be seen shortly.

It can also be noted (line 5) that more than three-quarters of PCB's lending costs were incurred at the branch level, while only 43 percent of the ADB's lending costs occurred in its branches. The ADB's operations are much more centralized than those of the PCB's. The large incidence of special lines of credit and externally funded projects in the ADB forced this centralization. The central office spends considerable time preparing reports to document the targeted use of external funds, an activity that cannot be handled by branches.

<sup>2/</sup> In 1981, delinquency rates (loans overdue/total portfolio) were approximately 5% in the PCB, and 50% in the ADB.

Another major difference between the banks is found in the proportion of total administrative costs involved in salaries and other personnel costs (line 6). Because the ADB made much smaller loans and was required to be more concerned with targeted objectives, one would have expected personnel costs to be relatively higher in the ADB than in the commercial bank. However, the opposite occurred. Personnel costs made up over 40 percent of the PCB's total administrative costs, but only a bit more than a quarter of the ADB's costs. The main explanation here is that the commercial bank paid much higher salaries to their employees than did the development bank, in the expectation of higher levels of employee productivity. The information in table 8 (lines 7-9) also shows that the PCB spends much more on loan evaluation, less on loan monitoring, and much more on loan recovery than does the ADB. These figures provide very strong insights into why the ADB has much more serious loan recovery problems than the PCB. The the ADB spends less time and effort extending and recovering loans than does the private bank! In doing so it also rewards its employees less than does the PCB.

#### Donor and Government Funds

Because the ADB receives a large part of its funds from the government or donor agencies through the central bank, only a small part (23 percent) of its total administrative

Table 8. Lending and Deposit Mobilization Costs in  
A Commercial Bank and A Development Bank  
in Honduras.

Costs	Commercial Bank	Development Bank
1. Average lending cost per agricultural loan	Lps. 1,748 <sup>1/</sup>	Lps. 260 <sup>1/</sup>
2. Average lending cost per lempira lent (%)	2.5	8.4
3. Lending costs/overall costs (%)	33	77
4. Costs of deposit mobilization and other services/overall costs (%)	67	23
5. Branch level costs/ total lending costs (%)	77	43
6. Personnel costs/ total lending costs (%)	41	27
7. Loan evaluation costs/ total lending costs (%)	45	16
8. Loan monitoring costs/ total lending costs (%)	4	7
9. Loan recovery costs/ total lending costs (%)	14	6

Source: Bank income and expenditure statements and  
branch-level surveys.

<sup>1/</sup> 1 U.S. dollar = 2 lempiras

costs result from non-lending efforts (line 4). The opposite is true for the private bank. About two-thirds of its total administrative costs result from non-lending activities, mainly deposit mobilization. While the rediscounted funds from the central bank are usually extended to the ADB on concessionary terms, these funds are not cheap. In most cases these rediscount lines carry targeting, documenting and reporting requirements that impose a good deal of extra effort and cost on the ADB.

To shed more light on the effect these external funds have on the loan transaction costs of the two banks, we documented the branch level costs for a sub-sample of the private bank branches that handled relatively large amounts of funds provided by an international donor. We were able to document and separate the lending costs incurred in managing the bank's own funds as well as targeted funds provided by the donor through rediscount facilities in the central bank by two loan size categories: less than 125 thousand lempiras, and those of more than this amount. The donor funds were all targeted to agricultural loans of less than 125 thousand lempiras. The information we collected shows the costs incurred per loan and per lempira lent by the bank in handling the specified loan applications. (For the sub-sample of branches studied, central office costs add 0.6 percent as an overhead cost to the branch level costs reported here.)

As can be noted in table 9, there were large differences in administrative costs by loan size groups. As expected, the large loans were less expensive to administer per unit of money lent than were the smaller loans. However, we found surprisingly large differences in the lending costs by end-use of funds. Even though the costs per loan did not show important variations across different end-uses, average loan-sizes by end-use ranged between 10 thousand and 50 thousand lempiras. This implies important differences in the costs per lempira lent. While the private bank loans of less than 125 thousand lempiras for industrial purposes only involved administrative costs of 1.3 percent, loans for housing and real estate had costs reaching 7.2 percent. Loans made for agricultural purposes in the smaller loan size category had mid-range administrative costs of 3.1 percent.

The most interesting figure in the table is the administrative cost per unit of money lent for the agricultural loans made from donor funds. These loans involved an average cost per loan operation five times as large as the costs of extending agricultural loans from the bank's own funds. Yet, the average size of donor-funded agricultural loans was more than twice the size of agricultural loans financed with the bank's own resources. As a result, branch costs of agricultural loans made from donor funds amounted



Table 9. Private Commercial Bank Branch Lending Costs by Source of Funds, End-Use of Loans, and Loan Size.

Source of Funds and End Use of Loans	Loan Size					
	Less than L. 125,000			More than L. 125,000		
	Average Cost per Loan (Lps.)	Average Loan Size (Lps.)	Cost per Lempira Lent (%)	Average Cost per Loan (Lps.)	Average Loan Size (Lps.)	Cost per Lempira Lent (%)
<u>Bank's Own Funds</u>						
Agriculture	999	31,777	3.1	1,319	471,571	0.3
Industry	642	48,542	1.3	850	364,173	0.2
Housing	774	10,699	7.2	1,026	250,000	0.4
Commerce	642	39,672	1.6	850	250,200	0.3
Consumption	642	11,381	5.6	--	--	--
Other	642	39,090	1.6	850	257,440	0.3
<u>Donor's Funds</u>						
Agriculture	5,450	69,664	7.8	--	--	--

Source: Surveys of selected bank branches.

to 7.8 percent of the value of the loans made, more than twice the cost of agricultural loans extended from other funds managed by the private bank. Adding central office overhead costs to branch expenses pushed the total administrative costs on these agricultural loans to 8.4 percent. It is clear that the higher cost per unit of money lent in the case of the donor's funds do not result from a portfolio of small-sized loans. Instead, it is a result of a far more complicated and costly set of procedures associated with the administration of donor funds, as compared to the use of the bank's own funds.

Again, ignoring default risks, the administrative costs on donor funds far exceeded the 3-4 percent spread allowed on these loans for administrative costs. Because of other larger profitable activities, the private bank can tolerate these administrative losses. Unless margins are increased, or administrative costs reduced, it is very unlikely that the private bank will be eager to becoming heavily involved in underwriting the large administrative costs of handling donor funds. In contrast, the ADB, being a government bank, does not have the freedom of choice to avoid the punishment involved in handling large amounts of targeted money.

## 5. Summary and Conclusions

In this study we have documented and analyzed the effects of targeted funds on the intermediation costs of the National Agricultural Development Bank and a major private

commercial bank of Honduras. Our results show that loan targeting requirements imposed on lenders have significant cost-increasing effects on their operations.

We found that the increasing share of targeted funds for agriculture in the liability portfolio of the development bank has not resulted in an increased participation of agricultural loans in the portfolio. Our analysis also suggests that this increased reliance on targeted funds has not had a significant effect on the average loan size of the bank's portfolio of new loans. These findings indicate that loan targeting has failed to meet the goals of an increased share for agricultural credit and an increased share of small sized (i.e. small farmer) loans in the loan portfolio.

Regression analysis performed on the development-bank's cost function indicates that there is a lagged, "ratchet"-type effect of targeted funds on the intermediation costs of the agricultural development bank. Overall administrative costs and the marginal costs of lending increase as a result of additional funding received from external sources. This effect is more striking and significant in the case of foreign funds than in the case of central bank rediscount lines. However, greater reliance on own-deposits as a source of loan funds will have cost-saving effects on both overall administrative costs and the marginal costs of lending.

The comparative cost study of the development bank and the private commercial bank reinforces the findings summarized above. This study emphasizes the contrasts in the structure of lending costs and overall organization between the two banks. It is clear from the results of this comparative analysis that the source of funds these institutions strongly influences their lending costs. The private bank, relying more on local deposits, is more cautious and efficient in evaluating and screening loans at the branch level and, in general, delegates more decision-making to branches. The public sector bank is far more centralized, with a heavy overlay of administrative costs associated with the loan targeting criteria of external sources of finance. However, even the more efficient private bank cannot avoid or reduce the high costs associated with on-lending from foreign source funds.

In conclusion, loan targeting is largely ineffective in reaching its intended and desired goals. At the same time, targeted funds impose higher intermediation costs on lending institutions. International donors and local governments should seriously reconsider their loan-targeting policies in light of the significant cost-increasing effects these policies have on the financial intermediaries.

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